tracted from the American Journal of the Medical Sciences for April 1857.]

FRACTURES

OF THE

CK OF THE THIGH-BONE.

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WITH NINETEEN WOOD-CUTS.

I.—Mr. S., aged 78 years, a hardy yeoman from one of the hilly of New England, when more than a hundred miles from home, upset horse wagon, fell on his left hip, and could not get up. He was car- a house, and was visited by Dr. J. C. Dalton, a highly distinguished nal gentleman, who pronounced the case to be one of fracture of the the thigh-bone, and proceeded to apply a modification of Desault's int. In four or five days the patient became so restive under his con- among strangers, that he employed a carpenter to prepare him a box ould receive a bed together with himself and splint, with a view to ome. When the doctor heard of this, he remonstrated with no small f emphasis against the project, but without avail; the old man said as well die in one way as another, and home he would go. When was ready, he was wagoned home, and was carried forty miles on the of his journey.

een days after the injury, I visited him. He made a somewhat sin- earance lying in his box, which, to accommodate himself and splint, over six feet high, was not much less than ten feet in length. On the bedclothes, I perceived that his knee and foot were turned con- outwards. I took off the splint, and gave some passive motion to without his complaining of pain; I then flexed the thigh to a right h the body, and kept it a minute or two in that position. This, too, without giving pain. On flexing the thigh to an angle a little acute, ained that it hurt him in his groin. Pressure with the fingers upon the groin and behind the trochanter major, both in the flexed and extended position of the limb, gave him decided uneasiness. I compared the length of the limbs, as well as I then could, without being able to satisfy myself that there was shortening of the injured limb. I then asked the old gentleman if he wished to get up. He said that he did, but could not. He was assisted to get into a chair, and sat for some time. From that day onward, he wore no splint, and was got up from his bed daily. I gave it as my opinion that the neck of the bone was not fractured, inasmuch as it had strength enough to support the weight of the whole limb for a minute or two, but did not satisfy myself as to the exact nature of the injury. Soon after this, I received a letter from Dr. D., who expressed surprise at the opinion which he understood I had given, saying that, on his first visit to the patient, he found the limb everted and shortened more than an inch, and also detected crepitus. I wrote him in reply, that I founded my opinion on the fact that there was strength enough in the neck to support the limb without causing pain or doing manifest injury. In the course of four months, the patient could walk with a cane, but remained lame, and could never ride horseback, as he had formerly been accustomed to do.

Between two and three years after this, he died of an acute attack of visceral disease. The bone, on being carefully cleaned, presented the following appearances, viz., the neck shortened, and on its front a groove or depression running in a zigzag direction close to the head. The shaft rotated outward, so as to bring the corona of the head within one-third of an inch of the posterior inter-trochanteric ridge; while the distance of the corona of the head from the anterior inter-trochanteric line is one inch and three-eighths; and the head sunk below the level of the top of the trochanter major, making a shortening of more than half an inch. (*Vide* Fig. 1.) A vertical section

Fig. 1.

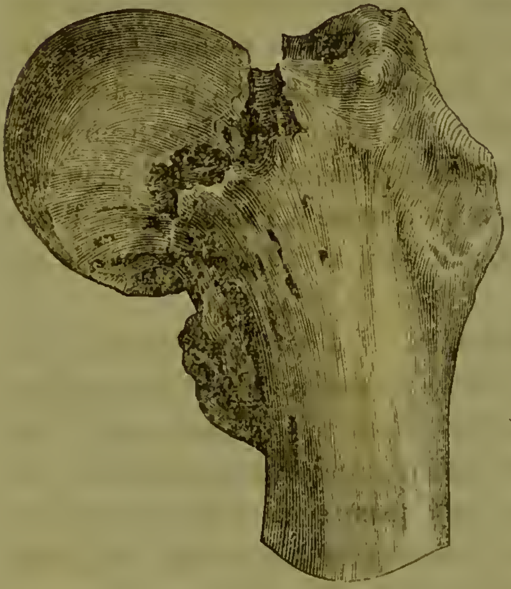
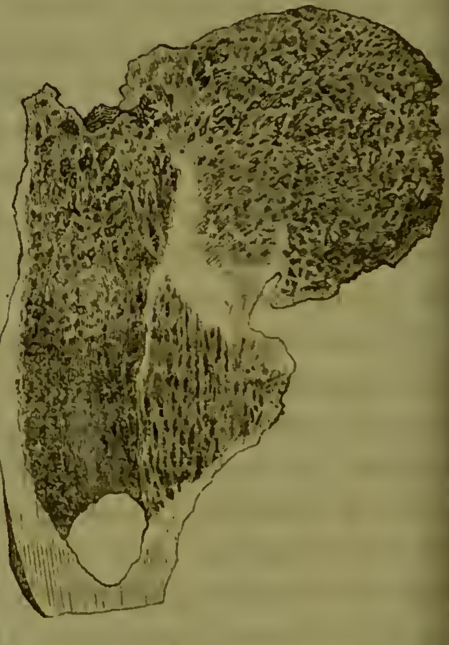


Fig. 2.



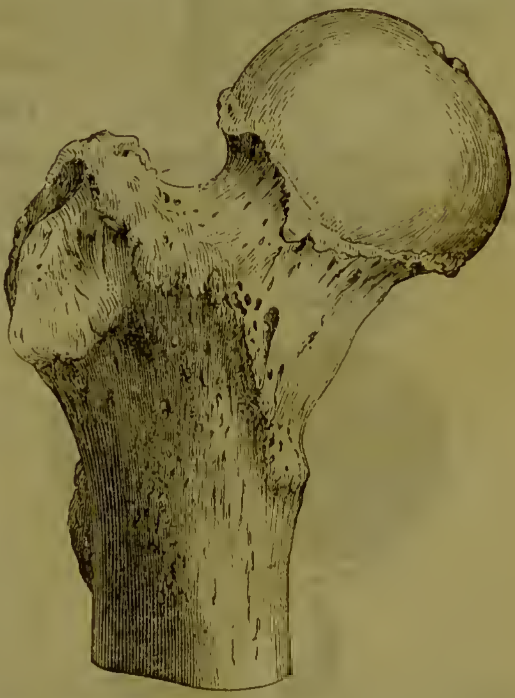
this made by a saw, shows a consolidation of the fracture by a deposit of
mass as compact and white as ivory. This is well shown in Fig. 2.

In the year 1830, I showed this to Messrs. Roux and Amussat, and some
her professional gentlemen in Paris; they regarded it as a fair specimen of
ony union of intra-capsular fracture. In London, I also showed it to Mr.
awrence, Mr. Travers, Mr. Stanley, and Dr. Hodgkin, who was then Curator
the Museum at Guy's Hospital. These gentlemen were interested with
e specimen, and considered it as a satisfactory example of bony union within
e capsular ligament. On my presenting it for inspection to Sir Astley
oper, he remarked, "This bone never was broken." I said, "Sir Astley,
ease to look at the interior of the bone." He separated the two halves,
d said, "This does look a little more like it, to be sure; but I do not think
is wholly within the capsular ligament." It is well known that Sir A.
oper, for some years, had taught the doctrine that bony union does not take
ace in intra-capsular fracture. His views, among the surgeons of Great
itain, were extensively admitted as correct.

At Edinburgh, I showed it to that distinguished surgeon, John Thompson,
ose work on inflammation had given him extensive notoriety. On care-
ly inspecting it, he declared, "upon his truth and honour," that it had
ver been broken. An opinion had prevailed for some time among sur-
ons, that in old persons the head of the thigh-bone is liable to sink below
ordinary level, with more or less
ortening of the neck; which occurs
certain morbid conditions without the
of mechanical violence. Mr. Thomp-
regarded this as an instance of that
d of change.

After returning to America, I ob-
ned the right thigh-bone from the
ne skeleton. Fig. 3 gives a very cor-
delineation of the head, neck, and
er part of the shaft of this bone.
ween this and the other specimen,
difference is very striking. The
k of this exhibits the ordinary angle
the shaft, and there is no depres-
of the head, and no mark across
neck.

Fig. 3.

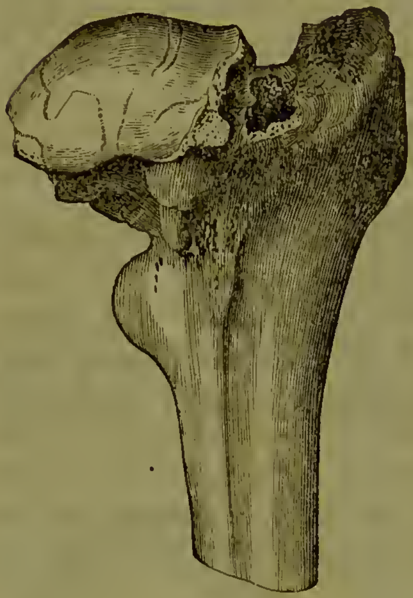


he professional gentlemen of our
ntry who have examined these specimens, unhesitatingly pronounce this
e a case of union by bone of intra-capsular fracture.

ASE II.—Mr. N., a corpulent man, aged 51, on getting out of his chaise,
upon his left hip, and was unable to walk. I saw him on the third day

after the injury, and found the knee and foot everted, and the limb shortened from an inch to an inch and a third. I could extend the leg to within about one-third of an inch of its natural length. When extended and rotated, it gave a distinct crepitus. I applied a long splint, modified from Desault's by Dr. Hartshorne, of Philadelphia. With this I kept up permanent extension; but was never able to bring the limb to its full length. When an attempt was made to do so, the patient complained of great pain in the groin. During the whole course of treatment, the limb remained from a third to half an inch shorter than natural.

Fig. 4.



A compress over the trochanter major was supported by the outer splint with a bandage around it including the pelvis. And, to counteract the tendency to external rotation, a pretty firm compress was kept behind the trochanter major, and the space between the mattress and the outer and back part of the limb was also occupied by a suitable compress. The splint was removed in eighty-four days; the patient from that time was able to sit in a chair, but could never flex the thigh quite to a right angle with the body. The limb was kept somewhat extended upon the carpet when he was in the sitting position. He ultimately walked with a cane. The shortening was relieved by a high-heeled shoe.

He survived the injury twelve years; and eight years after his death I obtained the specimen of injured bone, together with its fellow.

Fig. 5.

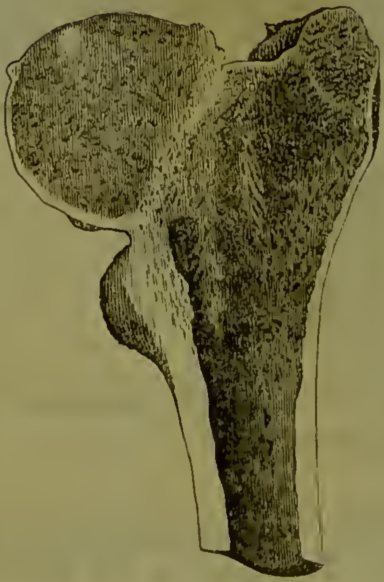


Fig. 6.

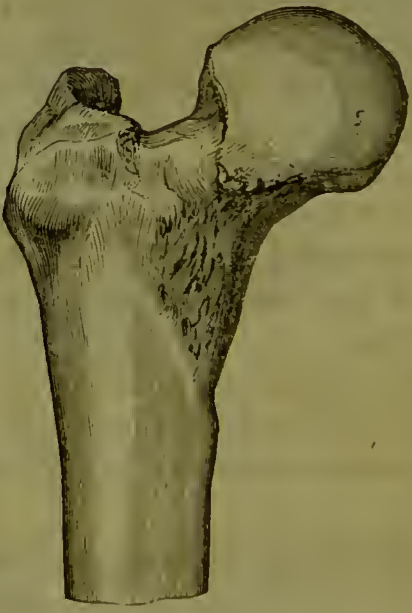


Fig. 4 is the injured bone. The head a little elongated and depressed, with a shortening of five-eighths of an inch; and much absorption of the neck. The distance of the corona of the head from the anterior inter-trochanteric line is seven-eighths of an inch; and the corona, posteriorly from the ridge, scarcely one-fourth of an inch.

Fig. 5 shows entire bony consolidation of the fracture.

Fig. 6 is the front view of the uninjured bone of the right side. The distance of the corona anterior from the inter-trochanteric line one inch; posterior, ditto, one and a quarter inch.

Case III.—Mrs. S. Mason, aged 73, a small, thin woman, was rendered helpless by falling upon her right hip. Two days after the accident, I was called to see her in consultation with my friend, Dr. Wm. Judkins, who was in attendance. The knee and foot were a little everted, with slight shortening, and tenderness on pressure in the groin and behind the trochanter major. She was averse to the application of any kind of splint, and, being in a delicate state of health, we allowed her to remain upon her couch, with the thigh and leg somewhat flexed and supported by a pillow. She remained in this situation about three months; after which, she could move with the aid of crutches, in a manner not very satisfactory to herself. She died in a year and a half after the accident, worn out by age and exhaustion.

Fig. 7 is a delineation of the injured bone. A considerable ridge runs across the anterior part of the neck, with a depression or irregular superficial groove between it and the head. The head of the bone is three-eighths of n inch below its natural level. The distance anterior from the corona of the ead to the inter-trochanteric line, is seven-eighths of an inch; posteriorly, alf an inch.

Fig. 7.

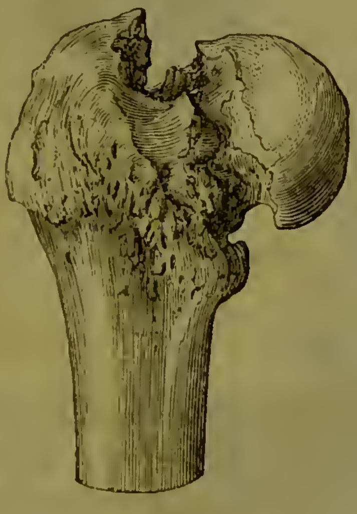


Fig. 8.

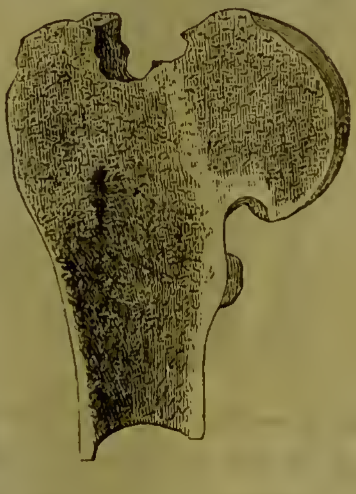


Fig. 8 shows the interior of the bone, with a narrow, white, and eburnated ne, corresponding with the aforesaid ridge, exhibiting a firm consolidation; e neck somewhat shortened.

Case IV.—Mr. F., æt. 82, a hardy yeoman, who had spent most of his life in Kentucky, fell upon his hip on a slippery sidewalk. He was helpless, and complained of great pain under any attempt at motion of the hip-joint. The limb was shortened, but to what extent could not then be ascertained, as he was unwilling to submit to much manipulation. It was judged best, by Dr. Fore and myself, to leave him without dressings. After three months lying upon his bed, he could move upon crutches. In the course of a year, he occasionally got about with a staff. He died in two years from the time of the injury. The *post-mortem* examination showed the bone with an intra-capsular fracture: the osseous portion of the neck wholly gone, and the entire of the osseous surfaces of the two fragments occupied by strong fibrous bands of one-third of an inch in length. The head, when pressed downward, just rested upon the trochanter minor, causing a shortening of one inch and an eighth. The strength of this fibrous production was amply sufficient to sustain the weight of the body.

Fig. 9 is a posterior view of this bone. The dark space between the head and trochanter major is designed to represent the fibrous connection of the two fragments.

Fig. 9.

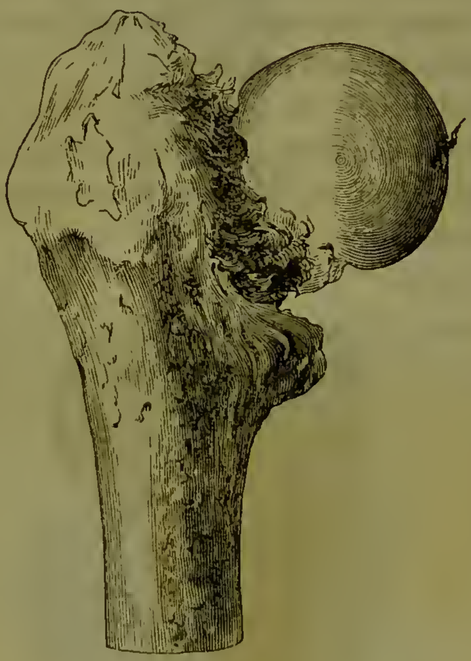
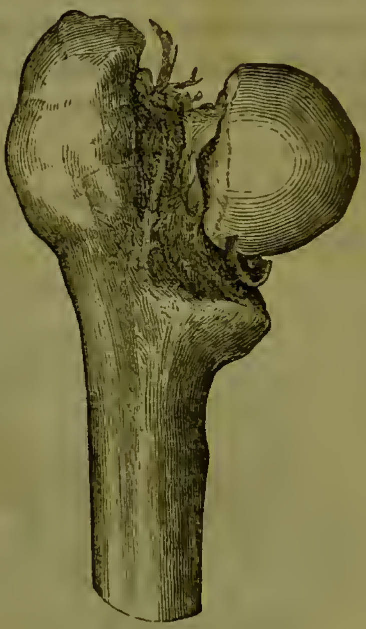


Fig. 10.



Case V.—Fig. 10 exhibits a posterior view of an intra-capsular fracture of the neck of the os femoris. The specimen is without history. It is interesting on account of the ligamentous connection of the fragments, which, from appearances at the time it was obtained, must have been sufficient for the ordinary purposes of locomotion. The bony portion of the neck absorbed.

Case VI.—Fig. 11, without history, shows a fracture at the neck which corresponds with the anterior inter-trochanteric line. The shaft is rotated very considerably outward. It is interesting from the evidence it affords that the fragments were never entirely separated from each other.

The head, unchanged in form, is depressed three-eighths of an inch below its proper level; its corona, from the anterior inter-trochanteric line, one and three-eighths of an inch; posterior, ditto, three-eighths of an inch; the neck in front not shortened.

Fig. 11.

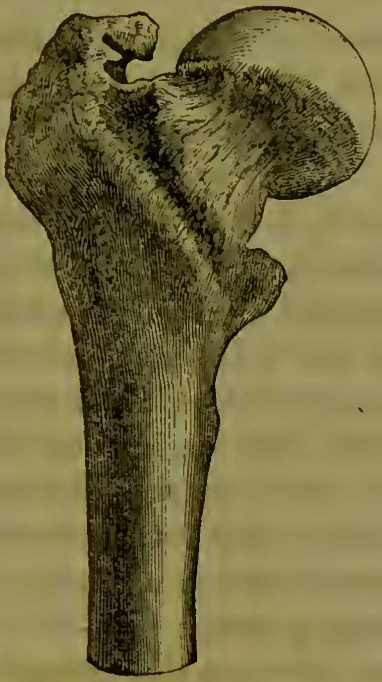


Fig. 12.

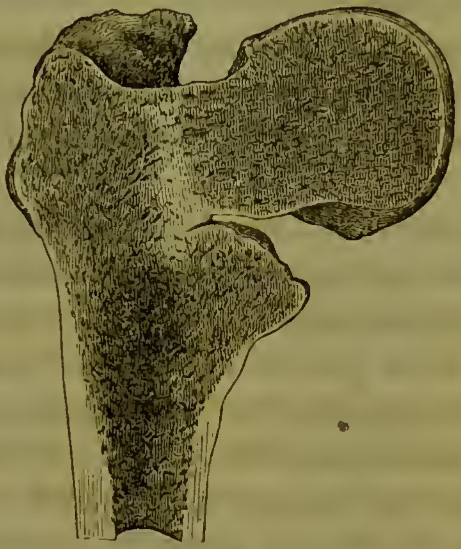
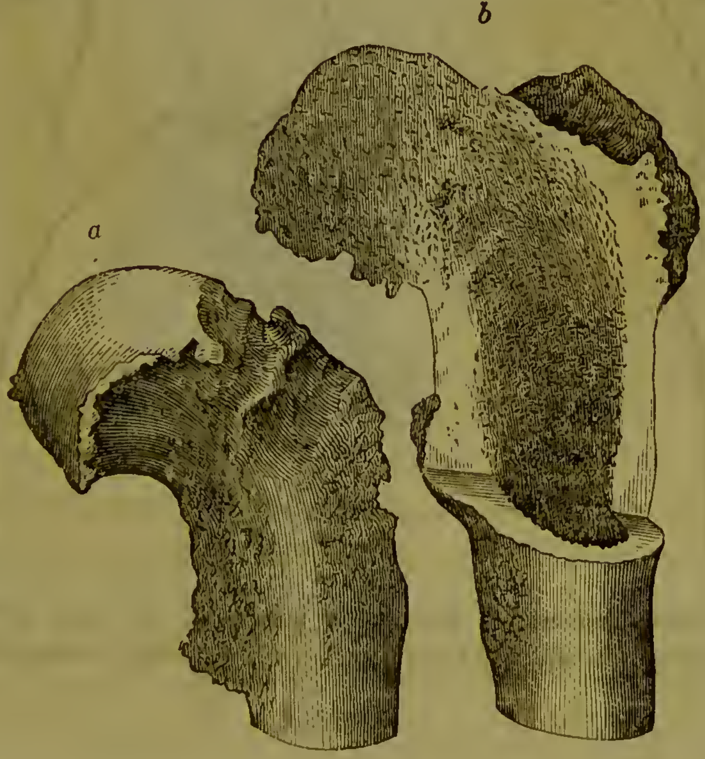


Fig. 12 shows the line of osseous consolidation of this fracture. In this figure the neck appears longer than in Fig. 11, which has been somewhat foreshortened by the engraver, the better to represent, as he supposed, the backward rotation of the shaft.

Fig. 13.



Case VII.—Fig. 13. Without history. Head depressed; shortening nearly the fourth of an inch; an irregular depression or wide groove in the upper and anterior part of the neck. The corona of the head from the anterior, one and a half inch; posterior, one-fourth of an inch.

Fig. 13, *a*, showing the irregular depression of the upper and anterior part of the neck.[1]

Fig. 13, *b*, showing the cancellous tissue somewhat changed from natural, and indicative, as I have always supposed, of the effects of violence, causing more or less fracture or crushing of the bony texture.

Case VIII.—On the 22d of last September, Dr. J. B. S. Jackson, brought before the Boston Society for Medical Improvement, a specimen of the right thigh-bone exhibiting a partial fracture of the neck. The fracture, commencing at the junction of the head with the upper part of the neck, extended to within about the fourth of an inch, or a little more, of the periosteal surface of its inferior and internal wall. Downward pressure upon the head opened the fracture at the upper part further than I should have expected, obvious and free motion being observable throughout its whole extent. On withdrawing the pressure, the opening closed, squeezing out the water in which the specimen had been recently immersed. The following is its history:—

The patient, a healthy man of forty-two years, to whom this belonged, fell through two stories of a building upon a hard floor, fracturing his back-bone

Fig. 14.

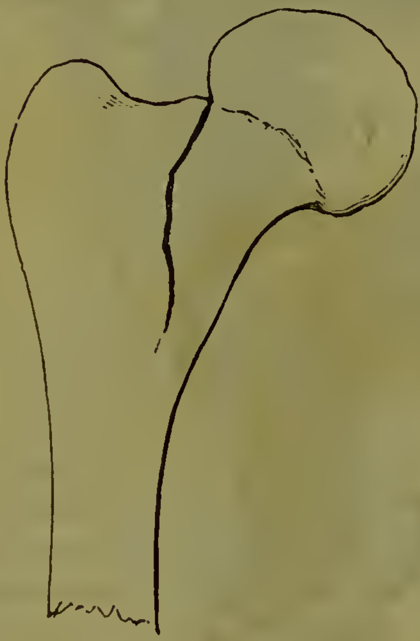
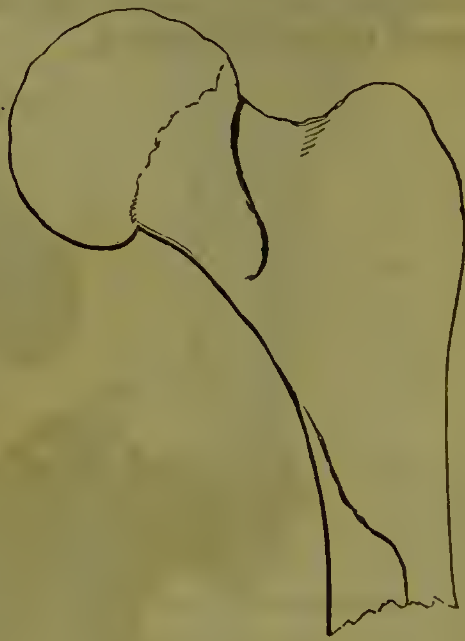


Fig. 15.



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[1] In all these measurements of distance of corona of the head from the inter-trochanteric lines, the point selected has been midway between the upper and lower part of the neck.

and the middle third of the shaft of the right thigh-bone, nearly in a transverse direction, complicated with another fracture extending upward from this, splintering the bone for several inches. The patient, admitted to the Massachusetts Hospital, under the charge of Prof. H. J. Bigelow, survived the accident eighteen days. The fracture of the neck was so extensive that the unbroken part would have been hardly sufficient to support the weight of his body under an attempt to walk, had he sustained no other injury. The wall of the shaft was compact and healthy looking. This specimen was justly regarded as quite remarkable, its like not being known to have a place in any museum.

Fig. 14 shows the line of fracture in front, and

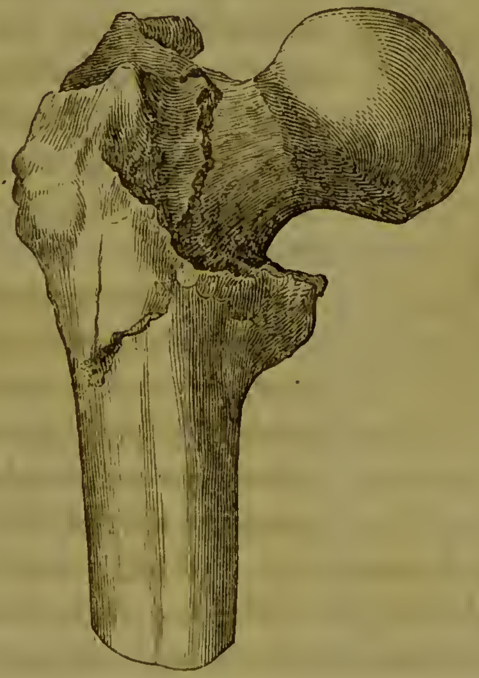
Fig. 15, a posterior view of it. The middle curved line in the lower part of the figure represents the terminal part of the longitudinal fracture of the haft.

Dr. Jackson has kindly given me the following items: "The length of the nterior line of fracture from the middle of the upper part of the neck to its ermination, as measured by a waxed thread, is two inches and eight-tenths f an inch. The distance between these two points, as measured by the allipers, is one inch and a fraction over five-tenths of an inch. The distance etween the anterior and posterior terminal points of the fracture upon the nner wall of the bone is nine-tenths of an inch, following the curve of the one, and measuring with a thread, as above. The distance between these wo points, with callipers, is eight and a half tenths of an inch."

The following four specimens of fracture are without history:—

Case IX.—Fig. 16. Fracture, partly intra and partly extra-capsular. No attempt at union.

Fig. 16.



Cases X., XI., XII.—Figs. 17, 18, 19. Extra-capsular fracture, consolidation, large bony deposit.

Fig. 17.

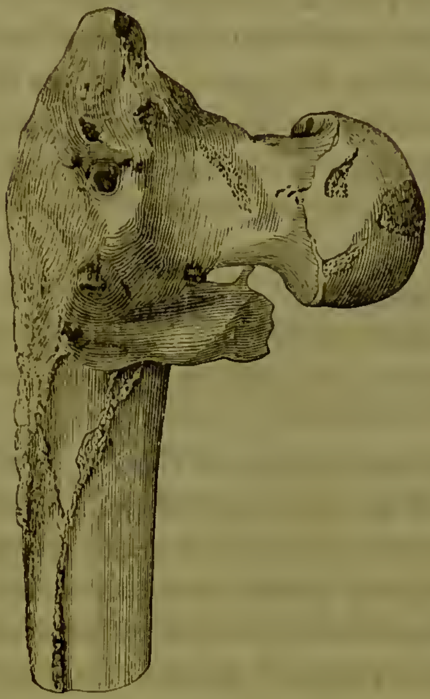
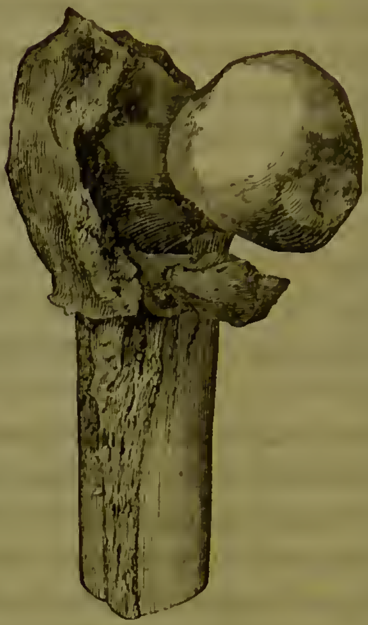


Fig. 18.



Under the influence of disease, the form and direction of the head and neck of the thigh-bone are liable to considerable changes; but these changes take place without any appearance of the bony texture having given way, or been crushed by mechanical violence. Rarely a specimen is met with in which there is a line, or superficial depression, or uneven surface upon the upper and anterior part of the neck, together with a sinking of the head below its ordinary level, and an alteration of the cancellated texture corresponding with the superficial mark; the other parts of the bone showing no evidence of disease having existed.

Fig. 19.

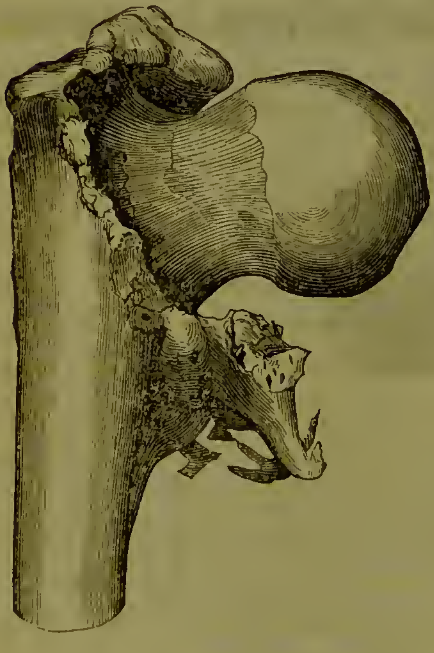


Fig. 13 is a specimen of this description.

In 1830, I saw at St. Bartholomew's Hospital, London, a specimen exhibiting the heads of both thigh-bones equally depressed below their ordinary level, and a similar line across the neck of each. Whether the shafts were rotated outwards, I cannot now confidently say, but the appearance of them was so like Fig. 13, which I had a few weeks before procured in Paris, that I regarded them as belonging to the same category, and their abnormal characteristics as probably the remote effects of mechanical violence. To this interpretation it was objected, by a gentleman present, that a force could not be believed to have been so equally applied to both bones, and that, therefore, disease or decay must have been the origin. If so equal an application of force be necessarily *rare*, and I have not met with another specimen like that at St. Bartholomew's, still it is not impossible. In the Museum of the City Hospital, New York, is a remarkable specimen, showing the upward and backward dislocation, by violence, of both hips. The head and neck of each thigh-bone lie upon the dorsum ilii at the same level. A fall with equal force on both feet or knees, the thighs being in the same relation to the median line, and under a certain degree of flexion, might cause a dislocation, and, when extended, a fracture. The patient, a German laborer, was crushed by the falling of a bank of earth upon him. Two unsuccessful attempts at reduction were made in the hospital. The man died several weeks after the accident in a state of squalid emaciation.

Dr. R. W. Smith, M. R. I. A., in his admirable work on *Fractures in the Vicinity of Joints*, mentions having seen an example of fracture of the radius on each side, in a man who fell with great force upon the palms of his hands. 'The lower extremity of each radius was broken about three-quarters of an inch above the wrist-joints. The inferior fragments were displaced backwards, and the deformity presented precisely the same features upon each side."

From the same distinguished author, we have the opinion that "the doctrine of partial fracture of the cervix femoris has not been established." The bone exhibited by Prof. J. B. S. Jackson (Figs. 14, 15), while it settles the question of the possibility of such fracture, does not invalidate the criticisms of Dr. Smith upon the cases of supposed partial fracture referred to by two eminent surgeons in Great Britain.

It cannot be doubted that fracture of the neck of the thigh-bone sometimes occurs in which bony union takes place without the fragments ever having been entirely separated. The case of Mrs. S. Mason (Case III., Figs. 7 and 8) must be considered as an example. There is a ridge across the front part of the neck, with a depression between it and the head; the neck a little shortened; the shaft rotated outward so as to approximate the posterior intertrochanteric line near to the head, and the head is somewhat depressed below its ordinary level. These features, joined with the history of the case, may be explained on the supposition that the fragments, at the time of the injury, were mutually driven or implanted into each other, and became consolidated in that position. If the fragments had been entirely separated, it should seem that, as no dressings were applied in the case, the action of muscles must have kept up a permanent displacement. A momentary inspection of Figs. 11 and 12, must be sufficient to show that the fragments were not entirely separated after the injury. The line of consolidation, as marked on Fig. 12, wholly intra-capsular; the fragments having been kept *in situ* after the injury, perhaps, by the cervical ligament, or the mutual crushing into each other of the fractured surfaces, or both. Sometimes, a fracture in a zigzag line, forming on each fragment toothed prominences, which interlock with each other, may be regarded as one of the means of preventing displacement and promoting bony consolidation.

In some instances of this fracture, patients have been able to walk soon after its occurrence. A distinguished member of the Boston bar, G. Blake, Esq., over sixty years of age, in ascending a long flight of slippery stone steps, in the Massachusetts State-house, fell, but immediately got up, walked up the remaining part of the stairway to the Senate Chamber. Soon after taking his seat, he got up to make a speech, but had not proceeded far before he felt a pain in his hip, which induced him to sit down. This soon became so severe that he was taken to his house in the city. The late Dr. J. C. Warren, then Professor of Surgery in the Boston School, was consulted, who declared the case to be one of intra-capsular fracture of the neck of the thigh-bone. Mr. B. was confined to his couch for some months; I think Dr. W. stated to me, without the application of a splint. After this, he occasionally rode out, walked with the aid of a cane, but seldom appeared abroad, as he did not like to exhibit himself in a limping gait. Two years from the injury, he died from visceral disease. Dr. W. had the opportunity of preserving the bone. There was a toothed form of fracture, wholly intra-capsular, sinking of the head below its natural level, with bony consolidation.

A Pole, not far from fifty years of age, was brought into our City Hospital at Cincinnati, several years ago. He had fallen on his hip, and professed to be unable to walk. I examined with care the limbs, but, for the first two days, could find no difference in the length of them. At the groin, and behind the trochanter major, there was a degree of tenderness on pressure. The second night after his admission, he got up and walked from his bed to the stove in the ward, a distance of four or five yards, as reported by one of the nurses. The next morning, on a careful comparison of both limbs, I made out a shortening of about a fourth of an inch, with slight eversion of the foot. The day following, there was a shortening of half an inch. I then applied a long splint, which kept up a degree of permanent extension for upwards of two months. After this, the man moved about the ward with crutches, and in a few weeks was discharged from the hospital with three-fourths of an inch shortening of the limb. My opinion was, that, at the time of the injury there was either a partial or complete intra-capsular fracture, the fragments being held together by the cervical ligament or the form of the fracture.

Several years ago, in the north part of Vermont, a very intelligent member of the profession, Dr. Colby, was consulted in the case of a woman who had recently fallen and lamed her hip. The doctor considered it to be a case of fracture of the neck of the thigh-bone, although the patient had walked a few steps. He directed the horizontal position, and applied an extending splint. She was kept in this situation for a month, during which time she showed symptoms of mental aberration; from this state, however, she ultimately recovered. She was able to walk after her confinement without any considerable degree of limping, or evidence of much shortening of the limb. The husband prosecuted the doctor for causing insanity by confining his wife, there having been, as he and his instigators alleged, no fracture. This case was in the law for some years, but, as I have understood, was ultimately taken out of court, each party paying his costs. In ten years from the time of eceiving the injury, the patient died. Both thigh-bones were taken, and the bone belonging to the injured limb had a ridge across the neck, while the head was so far depressed as to shorten the thigh-bone three-sixteenths of an nch. There were some few professional men who still alleged that there had been no fracture; but a number of eminent surgeons to whom both bones were presented for inspection, among whom was Dr. Warren, of Boston, decided that there *had been* fracture. From the description of the injured bone, given me by Dr. D. Crosby, Professor of Surgery in the New Hampshire Medical Institution, I should regard it as exceedingly like that of Mrs. S. Mason (Case III., Figs. 7 and 8), there being a distinct intra-capsular ridge across the anterior part of the neck; the fragments must have been by some means preserved from separation till the consolidation was accomplished.

The processes instituted by nature for the reparation of fracture are not without interest. When a fracture takes place in a situation where the roken surfaces are left in undisturbed contact, bony union follows without he deposit of callus. Fracture of the bones of the cranium is an example. When the fragments are subjected to a good deal of motion, there is deposit of bone-forming callus. Fractures of the limbs of the lower animals, that set well without the interference of surgery, show a large amount of callus. In situations where callus would essentially interfere with the ordinary functions of a part, as in intra-capsular fracture of the neck of the thigh-bone, we find no callus deposited, but if the fragments can be maintained in quiet pposition—whether by the cervical ligament, the mutual implantation or mpaction of the broken surfaces, or by mechanical appliances—the injury is paired by bony consolidation; whereas, when there is free motion of the agments upon each other, reparation, if it takes place at all, is brought bout by fibrous or ligamentous connection. So in fractures of the patella, llus is not formed, but osseous union takes place in vertical fractures of hat bone, and in transverse also, when the fragments are kept in apposition; ut when not, there is ligamentous connection only. I have seen a fracture cross the astragalus, from its upper to its lower articular surface, which was nited by bone without the least deposit of callus. In extra-capsular fractures, where there are several fragments exposed to much motion, the reparation is accomplished by the deposit of new bone cementing the fragments gether; and the more considerable the motion of the fragments, the greater, obably, is the amount of callus. When the small trochanter is implicated, ubjected, as it must be, to a good deal of motion from the two strong muscles inserted into it, an exuberant bony deposit is generally observable. In confirmation of this, reference may be made to Cases X., XI., and XII. (Figs. 17, 18, and 19), of the present series of engravings; also, to Dr. Smith's delineations, Cases XXXVII., XLI., XLIX., LIV., and LV.

All, then, that is required for the bony reparation of fracture, the constitutional health being good, is the undisturbed apposition of the broken surfaces. Thus, in those forms of extra-capsular fracture in which the neck of the thigh-bone is driven into and firmly impacted in the cancellous texture of the great trochanter, osseous union follows independently of callus; but when there are several fragments which are exposed to motion, callus steps in to hold them steady until the injury is repaired. When a fracture lies within the capsule of a joint, callus is not admitted there, as it would abridge or destroy the natural motions of the articulation; and the work is done by a flexible fibrous bond of union, when the broken surfaces are too far asunder, or have too much mobility for bony solidification. Is not all this as it should be, and does it not afford proof of intelligence and wisdom behind, giving direction and guidance to these processes?

I have a remarkable specimen, obtained without history, of dislocation of the shoulder-joint complicated with fracture of the large tubercle of the os humeri, and also of the coracoid process of the scapula. The head of the os humeri lies on the thoracic side of the neck of the scapula, and is firmly anchylosed to it; the large tubercle is cemented to the lower and outer part of the surgical neck of the humerus; while the terminal portion of the coracoid is fast adherent to the surface from which the great tubercle was torn. What arrangement of the parts in this complicated injury could have been better, or even as well, made? A bad dislocation of the shoulder remaining unreduced, the great tubercle and coracoid, with their muscles attached to each, subjected to irregular and ill-directed motions. Inasmuch as there could be no longer a shoulder-joint, for the benefit of the upper arm, was it not well to make the blade and arm-bone and broken pieces a fixture, in order to secure the greatest amount of utility for the forearm, as that is flexed largely, and, in a degree supinated by the action of the biceps, which must require fixed points of attachment for its two heads?

In the treatment of intra-capsular fracture of the thigh-bone, could we learn the precise position of the parts in the injury, we might, in some instances, leave the case without the application of splints, cases having repeatedly occurred in which the fragments were held in place till osseous union was accomplished. In healthy subjects, if the shortening be but littlo, the presumption is that nature can do the work, if the patient can be kept at rest; but so many instances have occurred in which, after several days, a great degree of shortening has suddenly taken place, that it may be well to apply some form of extending splint for at least a few weeks. The case of Mrs. S. Mason (Case III., Figs. 7 and 8) did exceedingly well without dressings. When the patient is very fat, in feeble health, advanced in life, with the weather hot, the confinement for several weeks, by a splint, can promise but ittle, if any, benefit. In the case of S. (Case I., Figs. 1 and 2), there was hortening, according to Dr. D.'s account, of more than an inch; there must have been a rupture, more or less, of the upper part of the cervical ligament, while at the lower part of the neck the ligament was left entire, and probably aided in guiding the toothed fractured surfaces into each other when extension was made. This was continued for eighteen days, during which time the probability is that so much adhesion had taken place as to prevent displacement afterwards. In N.'s case (Case II., Figs. 4 and 5), there was certainly hortening to the extent of considerably more than an inch, and I cannot help believing that the dressings, including the pressure upon the trochanter major, and the support behind it, must have been necessary to the bony consolidaion of the fracture.

In fractures of the lower limbs, in order to ascertain their comparative ength, I have for several years been in the habit of placing the patient on is back with the limbs extended, upon a level surface at least as firm as a mattress, and having a line extending from the middle of the upper part of he sternum, over the symphysis pubis and downward below the feet, held straight by assistants, to represent the median line of the body, while the two nternal malleoli of the tibia are brought in contact with this line. In this way, a very small difference in the length of the limbs, certainly less than the ne-fourth of an inch, can be ascertained. The measurements between the nterior superior spinous process of the ilium and the patella are liable to inccuracy, from the difficulty in having both thighs flexed precisely at the same ngle, and under the same degree of adduction.

CINCINNATI, *January* 15, 1857.